Using EMR to Implement and Track Compliance of a Unique Colon Bundle That Reduced Surgical Site Infection in Colorectal Surgery: A single institution review

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Introduction

Surgical site infections (SSI) remain a common complication of colorectal surgery and are associated with a significant increase in direct costs and hospital lengths of stay (1). Additionally, patients who develop SSI following colorectal surgery are at increased risk of postoperative morbidity and mortality (2).

Implementation of colorectal surgical care bundles are highly effective at reducing the incidence of SSI (3), both superficial and deep (1, 4, 5). While it is well studied that surgical care bundles reduce infection, there is no established consensus on the optimal amalgamation of pre-, intra- and post-operative interventions.

Increasing the number of preventative care measures within the bundle has been associated with a stepwise reduction in SSI (9). Checklists and use of standardized order sets have been successfully implemented to increase the compliance rates of these bundles (10-11).

This review presents the efficacy and implementation of a detailed surgical care bundle to reduce the rate of SSIs in patients undergoing colorectal surgery at single tertiary care institution. We illustrate how the use of EMR aids in the implementation and the ability to easily record and track compliance that leads to dramatic reductions in the incidence of SSI during colon surgery.

Methods

At Reading Hospital, a 700+ bed tertiary care center we created a multidisciplinary team made up of the Chief of Surgery, quality improvement coordinators, EMR staff, environmental services and periop leadership, to evaluated the current process and review the best practice guidelines and prevention bundles at other high performing institutions to form their own Bundle.

The current Colon Bundle consists of pre, intra and postoperative features shown below. This was implemented in December of 2015.

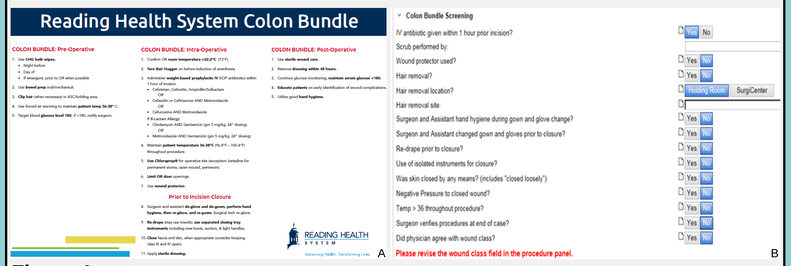
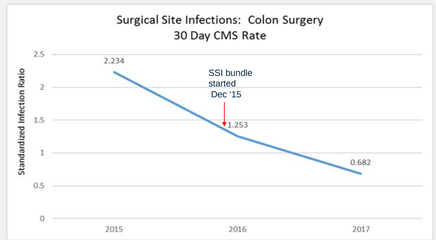


Figure 1

The benefit to this bundle focuses on continued surveillance of compliance with the incorporation directly into the EMR system. Intraoperative nursing staff are required to document key components of the bundle as part of their intraoperative paperwork (Figure 1B). This allows for generated monthly reports that track surgeon specific compliance and details where fallouts have occurred which allows for immediate reporting to surgeons. This also provides the opportunity for quickly addressing areas where hospital staff are not adhering to their portions of the bundle and a way to address why compliance is low for a given feature.

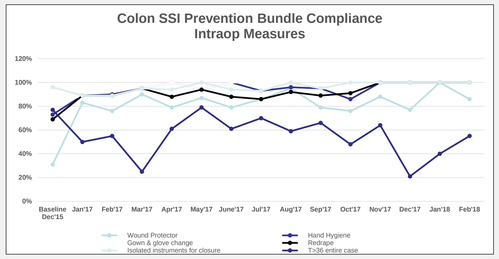
Results

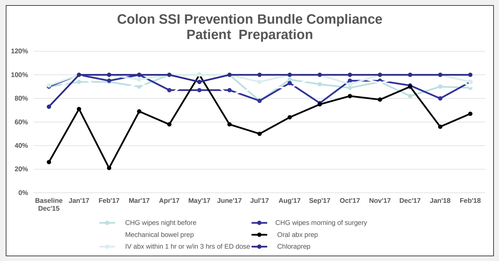
Prior to implementation of the Colon Bundle in December 2015, the SSI was 7.82% with a Standardized Infection Ration (SIR) of 2.431. The bundle was implemented and the rate of SSI dropped to 3.52% with a SIR of 1.25 in the first year and continued to drop the following year to 1.96% with a decrease in SIR to 0.68.



Year	# of Infections	# of Colon Procedures	Raw Rate (# infections/100 procedures)	Standardized Infection Ratio (SIR)
2015	18	287	6.27	2.234
2016	9	255	3.52	1.253
2017	6	306	1.96	0.682

When compliance was evaluated for the specific bundle components the majority of these showed an overall increase between July 2017 and September 2018.





Discussion

Overview of Findings

- Implementation of a unique Colon Surgery Bundle dramatically decreased the rate of SSI for colon surgery
- Compliance increased over time for various aspects of the bundle

Implications

- Continued surveillance via EMR allows for immediate recognition of fallouts as well as reporting of SSI directly to surgeons
- EMR helps quickly address issues of compliance and pinpoint specific areas for improvement

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